Depression at work

Heather Gilmour and Scott B. Patten

Worldwide, depression is the leading cause of chronic disability (Ustun, Yuso-Mateos, Chatterji et al. 2004). It can affect many aspects of life, including work. In fact, the impact of depression on job performance has been estimated to be greater than that of many other long-term ailments, such as arthritis, hypertension, back problems and diabetes (Kessler, Greenberg, Mickelson et al. 2001).

Although the various disabilities associated with depression may seriously impede an individual's ability to find and keep a new job,[1] many people who have recently had a major depressive episode (depression) are in the workforce. In 2002, the majority (71%) of 25- to 64-year-old Canadians who reported having experienced a major depressive episode in the previous 12 months were employed; however, symptoms associated with this condition may have hampered their ability to perform their jobs.

Indeed, depression among the employed has been linked with both absenteeism and diminished productivity (known as 'presenteeism'). In Canada, the cost of productivity losses in the form of short-term disability days due to depression was estimated at $2.6 billion in 1998 (Stephens and Joubert 2001).[2]

This article is based on results from the 2002 Canadian Community Health Survey (CCHS), cycle 1.2: Mental Health and Well-being, and the 1994/1995 to 2002/2003 National Population Health Surveys (NPHS) (see *Data sources and methodology*). The prevalence of a major depressive episode among employed Canadians aged 25 to 64 is first studied according to selected job, health and sociodemographic characteristics (see *Definitions*). The impact of depression on work impairment is then assessed via associations with reduced work activities, mental health disability days and work absences, using multivariate logistic regression models.

In this study, work impairment covers both absenteeism (absent from work one or more days the previous week) and presenteeism (reduced work activities). A third measure of impairment (at least one mental health disability day in the previous two weeks) combines elements of both, in that it represents days spent mostly or entirely in bed (absenteeism), as well as days respondents had to cut down on activities or expend extra effort to perform them (see *Work impairment*).

Almost half a million workers live with depression

An estimated 489,000 Canadians aged 25 to 64 who were employed at the time of their 2002 CCHS interview (3.7% of workers) had experienced a major depressive episode in the previous 12 months (Table 1). Moreover, an additional million workers (8% of the workforce) had experienced depression some time in their lives, although not in the past year (data not shown).

The occurrence of depression in the workforce was twice as prevalent among women as men (5.1% vs. 2.6%)[3] and was much more common among persons who were divorced, separated or widowed (7.5%)—as opposed to those married or in a common-law relationship (3.0%). Workers who lived in lower-income households were also more likely to suffer from depression than those living in higher-income households (4.7% vs. 3.4%). Persons with chronic health conditions lasting at least 6 months—such as arthritis, diabetes or cancer—were almost twice as likely as those without these ailments to have been depressed.[4] Differences by age and education were not significant.

Previous research has shown that work stress is linked to depression and other psychological disorders (Wang 2005 and Shields 2006). Data from the 2002 CCHS

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support this finding. Indeed, workers who reported high levels of work stress were more likely to have reported depression in the last 12 months than workers who had lower levels of work stress (6.0% vs. 2.5%). In addition, workers reporting anxiety disorders in the past 12 months, or alcohol or drug dependency, were much more likely to have suffered a major depressive episode during that period than those who did not have these problems (20.0% vs. 2.9% for anxiety disorders).

Depression was also associated with several job-related characteristics, including occupation and shift work. Sales and service workers and those in white-collar jobs were more likely than blue-collar workers to have faced depression in 2002 (Table 1).[5] Regular evening and night shift workers were more likely to report a major depressive episode than those working a regular day schedule (5.6% vs. 3.5%).[6]

The prevalence of depression was relatively low among workers who spent more than 40 hours a week on the job (2.6%), compared with those who worked less than 30 hours (5.7%). This discrepancy may, in part, reflect the impact of mental health on hours worked—at the time of the survey, many recently or currently depressed individuals may not have been capable of working full-time.

Depression interferes with work

CCHS respondents who reported a major depressive episode in the previous year were asked to what degree, on a scale of 1 to 10, the illness had interfered with various aspects of their lives during the period the symptoms had been

Table 1 Prevalence of major depressive episode in previous 12 months among employed 25 to 64 year-olds

	'000	%
Total	**489.0**	**3.7**
Sex		
Men (ref)	184.6	2.6
Women	304.3	5.1 *
Age		
25 to 44	317.2	4.1
45 to 64 (ref)	171.8	3.2
Occupation		
White-collar	264.6	3.9 *
Sales or service	107.9	4.6 *
Blue-collar (ref)	77.6	2.5
Weekly work hours		
1 to 29	90.5	5.7 *
30 to 40 (ref)	273.5	4.1
Over 40	124.3	2.6 *
Work schedule		
Regular day (ref)	331.7	3.5
Regular evening or night	48.1[E]	5.6[E] *
Irregular or rotating shift	109.2	4.0
High self-perceived work stress		
Yes	260.5	6.0 *
No (ref)	216.6	2.5
Marital status		
Married or common-law (ref)	292.7	3.0
Divorced, separated or widowed	98.8	7.5 *
Single (never married)	96.5	5.0 *
Education		
High school graduation or less (ref)	151.5	3.5
Some postsecondary	35.5[E]	4.2[E]
Postsecondary certificate, diploma or degree	296.4	3.8
Household income		
Lowest, lower-middle or middle	114.6	4.7 *
Upper-middle or highest (ref)	344.1	3.4
Chronic condition		
Yes	328.2	4.9 *
No (ref)	159.8	2.5
Body Mass Index category		
Underweight or normal (ref)	241.0	4.0
Overweight	162.3	3.5
Obese	77.5	3.4
Anxiety disorder in past 12 months		
Yes	108.3	20.0 *
No (ref)	357.4	2.9
Anxiety disorder in lifetime, but not in past 12 months		
Yes	46.4	5.0 *
No (ref)	311.0	2.7
Alcohol or drug dependence in past 12 months		
Yes	28.7[E]	9.3 *
No (ref)	458.6	3.6

* Significantly different from the reference group (ref) at less than the 0.05 level.
Source: Statistics Canada, Canadian Community Health Survey, cycle 1.2; Mental Health and Well-being, 2002

Definitions

In the CCHS, respondents were initially asked if they had experienced several days or longer when most of the day they had felt sad, empty or depressed; or very discouraged about how things were going on in their lives; or they had lost interest in most things they usually enjoyed—like work, hobbies and personal relationships. Those responding in the affirmative to at least one scenario were asked more specific questions to determine if they had a lifetime history of major depression, and if they had experienced a major depressive episode in the previous 12 months.

In the NPHS, the criteria were simpler and respondents were asked only a subset of questions.

An overall score was calculated for each respondent, and the results transformed into a probability estimate of a diagnosis of major depression in the previous 12 months. An individual was considered to have experienced a major depressive episode if the probability of a correct diagnosis was 90% or greater. A complete listing of the specific questions for both surveys can be found in the original study (Gilmour and Patten 2007). In this analysis, CCHS estimates of a major depressive episode exclude persons reporting a lifetime episode of mania; these people are included in NPHS estimates, however.

Respondents were **employed** if they had worked the week before their interview, or had a job or business from which they had been temporarily absent, for reasons such as illness, vacation or family responsibilities. Both employees and the self-employed were surveyed.

CCHS **occupation** data were collapsed into three broad categories: white-collar (management; professionals; technologists, technicians and persons in technical occupations; and administrative, financial and clerical occupations), sales or service, and blue-collar (trades, transport and equipment operators; farming, forestry, fishing and mining; and processing, manufacturing and utilities). Occupations from the NPHS were categorized as white-collar (administrative and professional), sales or service, and blue-collar.

Weekly work hours is the number of hours *usually* worked at a job or business, including paid or unpaid extra hours.

Work schedules were: regular day schedule; regular evening or night shift; and rotating or irregular shift (split, 'on call', irregular and other work schedules).

Weekly work hours and schedules were based on the main job (i.e. the job involving the most weekly hours).

Household income ranges were based on the number of people in the household and their combined income from all sources in the preceding 12 months.

Chronic health conditions in the CCHS are long-term conditions that lasted or were expected to last six months or more and were diagnosed by a health care professional: asthma; arthritis and rheumatism; back problems (other than fibromyalgia and arthritis); high blood pressure; migraine headaches; chronic bronchitis, emphysema and COPD (chronic obstructive pulmonary disease); diabetes; epilepsy; heart disease; cancer; stomach and intestinal ulcers; the effects of a stroke; bowel disorders (e.g. Crohns disease, colitis); Alzheimers disease and other dementia; cataracts; glaucoma; and thyroid conditions.

The NPHS considered: asthma; arthritis and rheumatism; back problems (other than arthritis); high blood pressure; migraine headaches; chronic bronchitis and emphysema; diabetes; epilepsy; heart disease; cancer; stomach and intestinal ulcers, the effects of a stroke; Alzheimers disease and other dementia; and glaucoma.

Body Mass Index (BMI) was calculated by dividing weight in kilograms by height in metres squared. Three categories were used: underweight/normal (BMI less than 25), overweight (25 to 29), and obese (30 and over).

Respondents were considered to have had an **anxiety disorder** in the past 12 months if they met the diagnostic criteria for panic disorder, or agoraphobia or social anxiety disorder during that period.

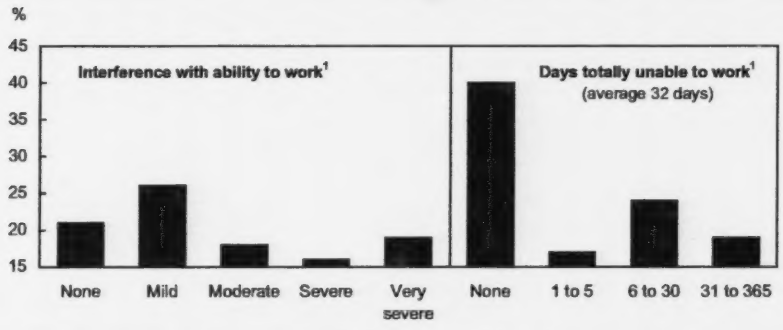
Alcohol or drug dependence in the past 12 months refers to respondents who met the criteria for dependence on alcohol or illicit drugs.

The **daily smoker** variable was available from NPHS respondents only.

Household size and income

Income range	People in household	Total household income
		$
Lowest	1 to 4	Under 10,000
	5 or more	Under 15,000
Lower-middle	1 or 2	10,000 to 14,999
	3 or 4	10,000 to 19,999
	5 or more	15,000 to 29,999
Middle	1 or 2	15,000 to 29,999
	3 or 4	20,000 to 39,999
	5 or more	30,000 to 59,999
Upper-middle	1 or 2	30,000 to 59,999
	3 or 4	40,000 to 79,999
	5 or more	60,000 to 79,999
Highest	1 or 2	60,000 or more
	3 or more	80,000 or more

Chart A Most workers experiencing depression reported some impact on their job performance



1 In the past 12 months.
Source: Statistics Canada, Canadian Community Health Survey, cycle 1.2; Mental Health and Well-being, 2002

most severe. They were also asked how many days depressive symptoms had rendered them totally unable to work or carry out normal activities.

Most workers (8 in 10) who had experienced depression in the 12 months prior to their interviews reported that their symptoms had interfered with their ability to work to some degree (Chart A). For example, one in five had experienced very severe interference with their ability to perform their jobs, and an additional one-third had experienced moderate to severe interference. On average, workers with major depression had been totally unable to work or carry out normal activities for 32 days in the course of the previous year.

The marked degree to which depression interferes with the ability to function at work is not surprising, since symptoms can include a loss of energy, disinterest in the job and a diminished ability to focus on tasks, combined with feelings of discouragement or hopelessness. Many elements crucial to competent job performance can be affected by such symptoms, for instance, time management, concentration, teamwork and overall output (Burton, Pransky, Conti et al. 2004).

Nonetheless, one in five workers who experienced depression in the previous year reported no interference at work. Even more (40%) never had a day when they had been totally unable to work or carry out normal activities. In the case of these workers, symptoms may have been relatively mild or not the kind to get in the way of work, or perhaps the impact of their depression had been greater in other aspects of their lives, such as their ability to carry out family responsibilities.[7] In fact, consistent with earlier research (Kessler, Berglund, Demler et al. 2003), mean interference scores (i.e. the degree to which depression was impeding various activities) were significantly higher in the realms of respondents' social lives and home responsibilities than those of work (Chart B).

Many aspects to work impairment

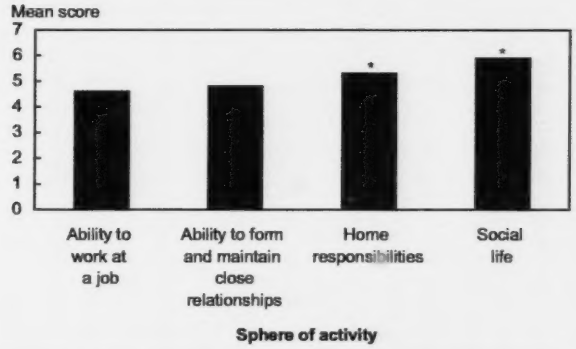
Workers who had experienced major depression were more likely than those with no history of the illness to report

- reduced work activities due to a long-term physical or mental condition or health problem
- at least one mental health disability day in the previous two weeks
- absence from work one or more days the previous week (see *Work impairment*).

Compared with workers declaring no history of major depression, those who had suffered an episode in the previous 12 months were about three times more likely (29% versus 10%) to report reduced work activities as a result of a long-term health condition (Chart C). Respondents who had not experienced depression in the previous year but had a lifetime history were also at increased risk of curtailing work activities (16%). In some cases, these workers may have intentionally cut back on their activities to reduce work stress and/or minimize the risk of another episode. They could also have been experiencing sub-clinical depression,[8] which has been linked to functional impairment (Martin, Blum, Beach et al. 1996).

Depression was also strongly associated with mental health disability days: 13% of workers who had experienced depression in the previous year reported at least one day in the two weeks preceding the interview when they had stayed in bed, cut down on normal activities or taken extra effort in carrying out

Chart B Depression affected non-work activities more significantly



* Significantly different from the Ability to work at a job score at less than the 0.05 level.
Note: Scores range from 0 (no interference) to 10 (very severe interference); for more details, see *Work impairment*.
Source: Statistics Canada, Canadian Community Health Survey, cycle 1.2; Mental Health and Well-being, 2002

cant, multivariate models that controlled for these factors and other possible confounders (e.g. respondents' sociodemographic and job characteristics), were carried out (see *Data sources and methodology*). When the effects of these factors were taken into account, the associations between depression and work impairment continued to persist. Indeed, workers who had experienced a major depressive episode in the previous year had twice the odds of reporting reduced work activities and recent work absences, and six times the odds of having taken one or more mental health disability days in the previous two weeks, compared with those who had no history of depression (Table 2).

Job characteristics may interact with the nature and severity of work impairment

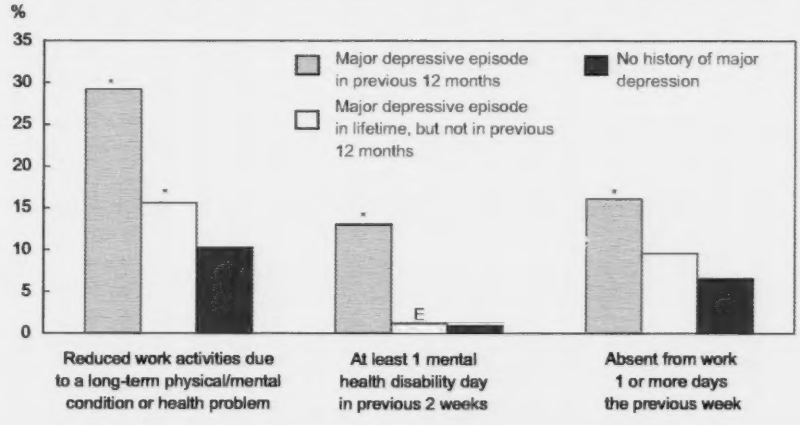
The association between depression and work impairment may be particularly strong for people in certain occupations and employment situations. Consequently, the models for work impairment were rerun with interaction terms between depression and occupation, working hours and work schedule.

daily activities because of emotional or mental health, or the use of alcohol or drugs. By contrast, only 1% of workers without a history of depression reported one or more mental health disability days.

Work absences were far more common among people who had experienced depression during the previous year than among those with no history of depression: 16% of workers with depression reported having been absent at least one day the previous week, compared with 7% of respondents who had never experienced depression.

Depression often co-exists with other psychiatric illnesses, substance abuse or physical illnesses or conditions that can impede an individual's ability to work. To determine whether the associations between depression and work impairment were statistically signifi-

Chart C Work impairment much higher among depression sufferers



* Significantly different from the estimate No history of major depression at less than the 0.05 level.
Source: Statistics Canada, Canadian Community Health Survey, cycle 1.2; Mental Health and Well-being, 2002

Data sources and methodology

The 2002 **Canadian Community Health Survey (Cycle 1.2): Mental Health and Well-being** (CCHS) was conducted over May to December 2002, and covered people aged 15 and older living in private households in the 10 provinces. Residents of institutions, members of the regular Armed Forces and civilian residents of military bases were excluded, as were people living on Indian reserves and in certain remote areas.

One person from each sampled household was randomly selected to be interviewed and proxy responses were not accepted. The resulting sample comprised 36,984 individuals aged 15 or older.

The **National Population Health Survey** (NPHS) has collected information about the health of Canadians every two years since 1994/1995. The reference period in the survey is the previous twelve months. To deal with seasonal variation, collection takes place in June, August, November and March. The survey covers residents of households and institutions in all provinces and territories, excluding Indian reserves, Armed Forces bases, and some remote areas.

In 1994/1995, a sub-sample was selected from the 10 provinces to create a longitudinal panel of 17,626 persons. This study used the panel's 5th cycle, (2002/2003).

Multivariate logistic regression models examined associations between a major depressive episode in the preceding year (or at some earlier period, or not at all) and work impairment. The models were re-run to include interaction terms between depression and various job characteristics.

Separate regressions were run on working respondents who had experienced depression in the previous 12 months to determine if various coping behaviours, as well as low co-worker, supervisor and emotional social support, were associated with work impairment.

Because of small sample sizes, the models were run for men and women combined. Interactions between sex and depression were not significant in any of the models.

Factors associated with reduced work activities and at least one disability day due to illness or injury in the previous two weeks were examined longitudinally. Four cohorts of observations were used for the analysis of reduced work activities (1994/1995 to 2000/2001 baseline years), and two cohorts (1994/1995 and 1996/1997 baseline years) for the analysis of at least one disability day in the previous two weeks. Workers aged 25 to 64 not reporting reduced work activities in baseline years were selected for the first model; those not reporting a disability day in the previous two weeks were selected for the second model.

Multivariate logistic regressions were carried out to examine workers baseline year characteristics in relation to reports of work impairment two years later. Some CCHS variables used in the cross-sectional models were not available on the NPHS's longitudinal file or were available for some cycles only.

All estimates and analyses were based on weighted data reflecting the age and sex distribution of the household population aged 15 and older in 2002 in the 10 provinces. To account for survey design effects, standard errors and coefficients of variation were estimated using the bootstrap technique (Yeo, Mantel and Liu 1999).

The interaction between depression and white-collar occupations was positive for reduced work activities. Although white-collar workers were generally less likely than blue-collar workers to reduce their work activities (Table 2), white-collar workers who had suffered a recent episode of depression had almost three times the odds of reducing their activities at work (data not shown). This difference may indicate that depression has a greater impact on activities that are more common in white-collar jobs compared with other occupations.

An association between depression and reduced work activities also emerged for people who regularly worked evening or night shifts, as opposed to those working regular daytime schedules.[9] A previous study showed relationships between evening shifts and psycho-social problems, chronic health conditions, sleep problems, and distress (Shields 2002). It may be that depressive symptoms compound the impact of other health problems that are associated with shift work, thereby resulting in greater work impairment.

Work impairment is associated with particular coping mechanisms and the absence of social support

In numerous studies, various types of coping behaviours and available support have been associated with the risk of depression and other mental illnesses (Park, Wilson and Lee 2004, Ramage-Morin 2004, and Wilkins 2004). However, few studies have examined whether these factors are also related to the job performance of workers with mental disorders.

CCHS results show that workers who had experienced a recent depressive episode often used coping mechanisms that differed from those of other workers (Chart D). For example, workers who had suffered a major

Table 2 Depression and selected characteristics related to work impairment outcomes, employed 25 to 64 year-olds

	Reduced work due to long-term physical/mental problem	At least 1 mental health disability day in previous 2 weeks	Absent from work 1 or more days in previous week
	Adjusted odds ratio		
Major depressive episode			
In past 12 months	2.4*	6.2*	2.3*
In lifetime but not in past 12 months	1.3*	0.9	1.4
No history of major depression (ref)	1.0	1.0	1.0
Sex			
Men	1.1	0.8	0.6*
Women (ref)	1.0	1.0	1.0
Age			
25 to 44	1.2	0.8	0.9
45 to 64 (ref)	1.0	1.0	1.0
Occupation			
White-collar	0.7*	1.0	1.0
Sales or service	1.0	1.1	0.7*
Blue-collar (ref)	1.0	1.0	1.0
Weekly work hours			
1 to 29	1.2	1.1	0.9
30 to 40 (ref)	1.0	1.0	1.0
Over 40	1.0	0.5*	0.8*
Work schedule			
Regular day (ref)	1.0	1.0	1.0
Regular evening or night	1.0	1.7	1.2
Irregular or rotating shift	1.2	1.5	1.2
High self-perceived work stress			
Yes	1.4*	1.8*	1.2
No (ref)	1.0	1.0	1.0
Marital status			
Married or common-law (ref)	1.0	1.0	1.0
Divorced, separated or widowed	1.0	1.2	1.1
Single (never married)	1.1	1.7*	0.7*
Education			
High school graduation or less (ref)	1.0	1.0	1.0
Some postsecondary	1.1	0.8	1.0
Postsecondary certificate, diploma or degree	0.9	0.9	1.0
Household income[1]			
Lowest, lower-middle or middle	1.1	1.0	0.9
Upper-middle or highest (ref)	1.0	1.0	1.0
Existing chronic condition[2]	4.7*	1.9*	1.1
Body Mass Index category[1]			
Underweight or normal (ref)	1.0	1.0	1.0
Overweight	1.2	1.4	1.2
Obese	1.5*	0.9	1.0
Anxiety disorder in previous 12 months[2]	2.2*	5.9*	1.0
Alcohol or drug dependence in previous 12 months[2]	1.4	3.8*	0.9

1 To maximize sample size, the models include a missing values category (odds ratios are not shown for these).
2 The reference group is the absence of the particular characteristic.
* Significantly different from the reference group (ref) at less than the 0.05 level.
Note: Some odds ratios with lower/upper confidence interval limits of 1.0 were statistically significant before rounding.
Source: Statistics Canada, Canadian Community Health Survey, cycle 1.2; Mental Health and Well-being, 2002

depressive episode were significantly more likely to report that they coped with stress by avoiding people (66% vs. 33% of non-depressed workers), using negative means of tension reduction (e.g. drinking alcohol or smoking more than usual—82% vs. 53%), blaming themselves (74% vs. 50%), or wishing the situation would go away (91% vs. 76%). Moreover, when dealing with stress, those with depression were less inclined to talk to others (76% compared with 83% for those without depression) or try looking on the bright side (88% vs. 95%).

Depressed workers were also more likely to report low levels of co-worker support (47% vs. 32%), low supervisor support (24% vs. 17%) and low emotional social support (24% vs. 12%).

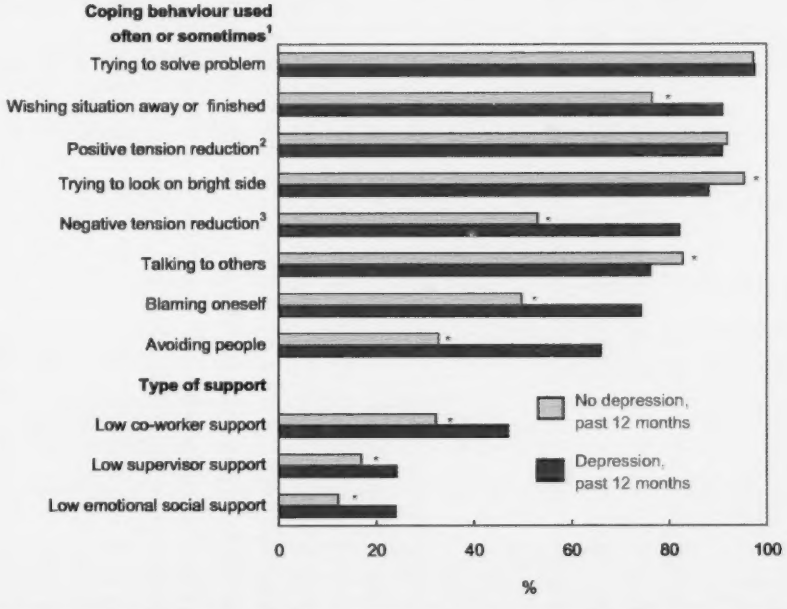
A multivariate model was used to adjust for sex, age, occupation, work hours, schedules, self-perceived work stress, marital status, education, income, chronic conditions, weight, and anxiety disorder or alcohol/drug dependence in the past 12 months. Coping behaviours and support variables were then entered individually. For the all workers group, the model also adjusted for depression.

Among employed respondents in general, most of the coping and support variables examined (7 out of 11—Table 3) were associated with having taken at least one mental health disability day in the previous two weeks, or having reduced work activities. When workers reporting a depressive episode were considered, only two variables were significant: trying to look on the bright side and low co-worker support.

'Trying to look on the bright side' reduced the odds of workers with depression taking at least one mental health disability day in the two weeks preceding their interviews. However, it is possible that the coping strategies assessed by the CCHS were influenced by the nature and extent of depressive symptoms. For example, because depressed people often have a negative perspective, the association with 'looking on the bright side' may reflect workers with mild, rather than moderate or severe, depression.

Low co-worker support increased the odds of depressed workers being absent from work one or more days the previous week. But because this analysis is cross-sectional, the direction of the association cannot be ascertained. It is not clear whether low co-worker support influenced work absence or vice versa.

Chart D Depression sufferers more likely to use negative coping behaviours



1 Respondents were not considered to use a particular coping behaviour when they reported doing it rarely or never.
2 Jogging or other exercise, praying or seeking spiritual help, doing something enjoyable.
3 Sleeping more than usual, eating more or less than usual, smoking more cigarettes than usual, drinking alcohol, using drugs or medication.
* Significantly different from the corresponding estimate for persons reporting a major depressive episode in the past 12 months at less than the 0.05 level.
Source: Statistics Canada, Canadian Community Health Survey, cycle 1.2; Mental Health and Well-being, 2002

Table 3 Coping behaviours and support related to work impairment outcomes, employed 25 to 64 year-olds

	Reduced work due to long-term physical/ mental problem		At least 1 mental health disability day in previous 2 weeks		Absent from work 1 or more days in previous week	
	All workers	Depression in past 12 months	All workers	Depression in past 12 months	All workers	Depression in past 12 months
Coping behaviour used often or sometimes[1]			Adjusted odds ratio			
Trying to solve problem	0.8	0.9	0.7	0.8	1.0	...
Wishing situation away or finished	1.3*	0.6	2.1*	0.6	0.9	0.8
Positive tension reduction[2]	0.9	0.5	1.1	2.1	0.7	0.4
Trying to look on bright side	0.9	0.7	0.5*	0.3*	0.9	1.4
Negative tension reduction[3]	1.4*	0.8	3.1*	2.6	1.2	1.2
Talking to others	0.8*	1.0	0.7*	0.6	0.9	1.6
Blaming oneself	1.1	1.7	1.3	1.3	1.1	1.4
Avoiding people	1.1	1.0	1.4	0.7	1.1	1.3
Type of support						
Low co-worker support	1.1	1.1	1.7*	0.8	1.1	1.9*
Low supervisor support	1.0	1.3	1.7*	1.1	1.3	1.1
Low emotional social support	1.5*	1.5	1.9*	1.7	0.7	1.1

1 As opposed to rarely or never (the reference group).
2 Jogging or other exercise, praying or seeking spiritual help, doing something enjoyable.
3 Sleeping more than usual, eating more or less than usual, smoking more cigarettes than usual, drinking alcohol, using drugs or medication.
* Significantly different from the reference (ref) group at less than the 0.05 level.
Note: Some odds ratios with lower/upper confidence interval limits of 1.0 were statistically significant before rounding.
Source: Statistics Canada, Canadian Community Health Survey, cycle 1.2; Mental Health and Well-being, 2002

Long-term consequences of depression

With cross-sectional data, it is not possible to determine whether depression leads to work impairment, or if workers who are limited in what they can do on the job are more likely to experience depression. Longitudinal data from the National Population Health Survey (NPHS) were used to shed light on the temporal sequence of these events.

For example, it is possible to examine whether workers who had experienced depression were more likely to suffer work impairments two years down the road. The longitudinal multivariate analysis shows that there are greater odds of work impairment two years later for individuals experiencing depression. Indeed, for workers who experienced depression the odds of having to reduce work activities two years later as a result of a long-term physical or mental condition were 1.4 times higher than for those who had not experienced a major depressive episode (Table 4). In addition, looking at work absences due to disability days taken shows that workers who were depressed had 1.8 times the odds of having these types of absences two years later, suggesting that the effects of depression on job performance can be long lasting. Other variables, however, were also indicative of work impairment. For example, workers who had chronic conditions, or were obese, also had higher odds of reducing their work activities or taking at least one disability day.

Conclusion

In 2002, nearly half a million employed Canadians aged 25 to 64, almost 4% of the workforce, reported the occurrence of a major depressive episode in the previous 12 months. An additional million workers had

Table 4 Depression and selected characteristics related to new cases[1] of work impairment 2 years later, employed 25 to 64 year-olds

	Reduced work due to long-term physical/ mental problem	At least 1 disability day in previous 2 weeks due to illness or injury
	Adjusted odds ratio	
Major depressive episode in previous 12 months[2]	1.4*	1.8*
Sex		
Men	0.9	0.7*
Women (ref)	1.0	1.0
Age		
25 to 44	0.8	1.0
45 to 64 (ref)	1.0	1.0
Occupation		
White-collar	0.8	1.2
Sales or service	0.8*	1.0
Blue-collar (ref)	1.0	1.0
Weekly work hours		
1 to 29	1.2	0.9
30 to 40 (ref)	1.0	1.0
Over 40	1.0	0.8*
Work schedule		
Regular day (ref)	1.0	1.0
Regular evening or night	1.3	1.2
Irregular or rotating shift	1.1	1.2
Marital status		
Married or common-law (ref)	1.0	1.0
Divorced, separated or widowed	1.2	1.4*
Single (never married)	1.3*	1.2
Education[3]		
High school graduation or less (ref)	1.0	1.0
Some postsecondary	0.7*	1.0
Postsecondary certificate, diploma or degree	0.7*	1.0
Household income[3]		
Lowest, lower-middle or middle	1.1	0.9
Upper-middle or highest (ref)	1.0	1.0
Chronic condition[2]	2.7*	1.8*
Body Mass Index category[3]		
Underweight or normal (ref)	1.0	1.0
Overweight	1.1	1.1
Obese	1.3*	1.4*
Low emotional social support[2]	1.2	0.9
Daily smoker[2]	1.4*	1.2

1 New cases were reported by respondents who had not declared work impairment two years earlier.
2 The reference group is the absence of the particular characteristic.
3 To maximize sample size, the models include a missing values category (odds ratios are not shown for these).
* Significantly different from the reference group (ref) at less than the 0.05 level.
Note: Some odds ratios with lower/upper confidence interval limits of 1.0 were statistically significant before rounding.
Source: Statistics Canada, National Population Health Survey, 1994-1995 to 2002-2003

experienced depression during some other period in their lives. The incidence of depression for women in the labour force was almost two times that of working men, and depression was less prevalent for workers who were married or in common-law relationships.

Consistent with similar research,[10] this study shows that depression is associated with both work absences and lost productivity in the form of reduced work activities. The analysis also reveals that depression has associations with work impairment that persist when the effects of workers' occupations, health conditions and sociodemographic characteristics are taken into account. There is also evidence that the effects of depression on job performance can be long lasting.

This analysis highlights the importance of white-collar occupations and night/evening shift work schedules in the link between depression and work impairment. As well, depressed workers dealing with stress often use coping mechanisms that may not be beneficial and differ from those favoured by other workers. Nevertheless, coping by trying to 'look on the bright side,' and the availability of co-worker support, may buffer the impact of depression on job performance.

Perspectives

■ Notes

1 See Lerner, Adler, Chang et al. 2004a; Marcotte and Wilcox-Gok 2001; and Virtanen, Kivimaki, Elovainio et al. 2005.

Work impairment

CCHS respondents reporting a major depressive episode in the preceding 12 months were asked more specific questions about the period lasting 1 month or longer, when their depression was most severe. They rated, on a scale of 0 (no interference) to 10 (very severe interference), how much their depression had interfered with:

- ability to work at a job
- home responsibilities
- ability to form and maintain close relationships with other people
- social life.

Odds ratios for **reduced work activities** were based on responses of often or sometimes (as opposed to never) to the CCHS question: "Does a long-term physical condition or mental condition or health problem reduce the amount or the kind of activity you can do: ... at work?" The NPHS question was similar, but responses were categorized as yes or no.

Respondents who had stayed in bed because of illness or injury (including nights spent as a patient in a hospital) during the previous two weeks were asked the number of days they did so.

Excluding days spent in bed, respondents were then asked if they had cut down on normal activities because of illness or injury; or, if it had taken extra effort to perform up to their usual level at work or when engaged in other daily activities. For both, the number of days was recorded. For any positive responses, persons were asked if this was due to emotional or mental health or use of alcohol or drugs.

CCHS respondents were considered to have experienced at least one mental health disability day in the previous 2 weeks if they reported spending at least one day during that period: in bed (most or all of the day) or having to cut down on normal activities (most or all of the day) or needing to expend extra effort to perform daily activities—because of their emotional or mental health, or their use of alcohol or drugs.

The equivalent NPHS-derived variable was compiled somewhat differently. Respondents were considered to have spent at least one disability day in the previous 2 weeks due to illness or injury if they had stayed in bed all or most of the day or cut down on normal activities as a result. The NPHS did not probe emotional or mental ill-health, or the use of alcohol or drugs.

2 This estimate combines the costs for people who suffered depression and distress at the same time, with the costs for those who suffered depression in isolation.

3 This pattern is also seen in the general population. For more information on gender differences in depression, see De Marco (2000), Noble (2005), Kuehner (2003), and Kessler, Berglund, Demler et al. (2003).

4 Other studies (for example, Kessler, Berglund, Demler et al. 2003, and Verhaak, Heijmans, Peters et al. 2005) have also associated depression with physical and mental comorbidity.

5 This finding is supported by other studies that have found differences in the prevalence of depression by occupation (De Marco 2000, Dewa and Lin 2000, and Wilhelm, Kovess, Rios-Seidel et al. 2004).

6 This association is consistent with earlier research that revealed a link between mental health and shift work (Shields 2002).

7 The 'days totally unable to work' variable likely underestimates the impact of depression on job performance, since this measure does not capture days when respondents went to work but could not fully carry out their duties. In other studies, mental disorders were found to be more strongly associated with days during which workers had to expend extra effort or cut back on work activities rather than complete days of work loss. Moreover, the former accounted for a greater proportion of the total economic costs of mental disorders borne by employers (Dewa and Lin 2000, Lim, Sanderson and Andrews 2000, and Stewart, Ricci, Chee et al. 2003).

8 Depressive symptoms are present but do not meet the diagnostic criteria for a major depressive episode.

9 This was evidenced by an odds ratio of 2.88, with a 95% confidence interval of 1.04 to 7.95 (data not shown).

10 See Lerner, Adler, Chang et al. 2004a, De Marco 2000, Lim, Sanderson and Andrews 2000, Stewart, Ricci, Chee et al. 2003, Kouzis and Eaton 1994, Lerner, Adler, Chang et al. 2004b, and Wang, Beck, Berglund et al. 2003.

■ References

American Psychiatric Association (APA). 2000. *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV^0-TR).* Washington, D.C.

American Psychiatric Association (APA).1980. *Diagnostic and Statistical Manual of Mental Disorders, Third Revised Edition (DSM-III^0-R).* Washington, D.C.

Béland Yves, Jules Dufour and Ronald Gravel. 2001. "Sample Design of the Canadian Mental Health Survey." *Proceedings of the Survey Methods Section*. Vancouver: Statistical Society of Canada. p. 93-98.

Burton, Wayne N., Glenn Pransky, Daniel J. Conti et al. 2004. "The association of medical conditions and presenteeism." *Journal of Occupational and Environmental Medicine*. No. 46 (6 Suppl.), S38-S45.

De Marco, R. R. 2000. "The epidemiology of major depression: Implications of occurrence, recurrence, and stress in a Canadian community sample." *Canadian Journal of Psychiatry*. Vol. 45, no. 1, p. 67-74.

Dewa, Carolyn S. and Elizabeth Lin. 2000. "Chronic physical illness, psychiatric disorder and disability in the workplace." *Social Science & Medicine*. Vol. 51, issue 1, p. 41-50.

Gilmour Heather and Scott B. Patten. 2007. "Depression and work impairment." *Health Reports*. Vol. 18, no. 1. February 2007. Statistics Canada Catalogue no. 82-003-XIE. p. 9–20. http://www.statcan.ca/english/freepub/82-003-XIE/82-003-XIE2006003.pdf (accessed November 16, 2007). http://www.statcan.ca/english/freepub/82-003-XIE/2006001/articles/depression.htm (accessed November 16, 2007).

Kessler, Ronald C., Patricia Berglund, Olga Demler et al. 2003. "The epidemiology of major depressive disorder: results from the National Comorbidity Survey Replication (NCS-R)." *Journal of the American Medical Association (JAMA)*. Vol. 289, no. 23, p. 30953105.

Kessler, Ronald C., Paul E. Greenberg, Kristin D. Mickelson et al. 2001. "The effects of chronic medical conditions on work loss and work cutback." *Journal of Occupational and Environmental Medicine*. Vol. 43, no. 3, p. 218-225.

Kessler, Ronald C., K.A. McGonagle, S. Zhoa et al. 1994. "Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States." Results from the National Comorbidity Survey. *Archives of General Psychiatry*. No. 51, p. 8-19.

Kouzis, Anthony C. and William W. Eaton. 1994. "Emotional disability days: Prevalence and predictors." *American Journal of Public Health*. Vol. 84, no. 8, p. 1304-1307.

Kuehner C. 2003. "Gender differences in unipolar depression: an update of epidemiological findings and possible explanations." *Acta Psychiatrica Scandinavica*. Vol. 108, no. 3, p. 163-174.

Lerner Debra, David A. Adler, Hong Chang et al. 2004. "Unemployment, job retention, and productivity loss among employees with depression." *Psychiatric Services*. Vol. 55, no. 12, p. 1371-1378.

Lerner Debra, David A. Adler, Hong Chang et al. 2004. "The clinical and occupational correlates of work productivity loss among employed patients with depression." *Journal of Occupational and Environmental Medicine*. No. 46 (6 Suppl.), S46-S55.

Lim D., G. Andrews and K. Sanderson. 2000. "Lost productivity among full-time workers with mental disorders." *The Journal of Mental Health Policy and Economics*. Vol. 3, no. 3, p. 139-146.

Marcotte, Dave E. and Virginia Wilcox-Gok. 2001. "Estimating the employment and earnings costs of mental illness: Recent developments in the United States." *Social Science and Medicine. Vol.* 53, no. 1, p. 21-27.

Martin, J.K., T.C. Blum, S.R. Beach et al. 1996. "Subclinical depression and performance at work." *Social Psychiatry and Psychiatric Epidemiology*. Vol. 31, no. 1, p. 3-9.

National Health Population Survey – Household Component - Longitudinal, Cycle 6 (2004-2005), Health Information and Research Division, Statistics Canada, Ottawa, 2006.

Noble, R.E. 2005. "Depression in women." *Metabolism*. Vol. 54, no. 5 (Suppl. 1), p. 49-52.

Park Kyoung-Ok, Mark G. Wilson and M.S. Lee. 2004. "Effects of social support at work on depression and organizational productivity." *American Journal of Health Behavior*. Vol. 28, no. 5, p. 444-455.

Ramage-Morin, Pamela L. 2004. "Panic disorder and coping." *Health Reports*. Statistics Canada Catalogue no. 82-003, vol. 15, supplement, p. 33-45. http://www.statcan.ca/bsolc/english/bsolc?catno=82-003-S20040007445 (accessed November 16, 2007). Supplement to Health Reports. 2004. "Annex." Statistics Canada Catalogue no. 82-003-S, vol. 15, p. 49-63. http://www.statcan.ca/english/freepub/82-003-SIE/82-003-SIE2004000.htm (accessed November 16, 2007).

Shields, Margot. 2006. "Stress and depression in the employed population." *Health Reports*. Statistics Canada Catalogue no. 82-003. Vol. 17, no. 4, p. 11-29. http://www.statcan.ca/bsolc/english/bsolc?catno=82-003-X20050049495 (accessed November 16, 2007).

Shields, Margot. 2002. "Shift work and health." *Health Reports.* Statistics Canada Catalogue no. 82-003. Vol. 13, no. 4, p. 11-33. http://www.statcan.ca/bsolc/english/bsolc?catno=82-003-X20010046315 (accessed November 16, 2007).

Statistics Canada. 2002. *Canadian Community Health Survey (CCHS): Mental Health and Well-being—Cycle 1.2.* Available at http://www.statcan.ca/english/concepts/hs/index.htm (accessed October 15, 2007).

Statistics Canada. 2004. "Annex: Definitions of mental disorders in the Canadian Community Health Survey: Mental health and well-being." *Health Reports.* Supplement to Volume 15. Catalogue no. 82-003-SPE. p. 65-79.

Stephens, Tomas and Natacha Joubert. 2001. "The economic burden of mental health problems in Canada." *Chronic Diseases in Canada.* Vol. 22, no. 1, p. 18-23.

Stewart, Walter F, Judith A. Ricci, Elsbeth Chee et al. 2003. "Cost of lost productive work time among US workers with depression." *Journal of the American Medical Association (JAMA).* Vol. 289, no. 23, p. 3135-3144.

Swain, Larry, Gary Catlin and Marie P. Beaudet. 1999. "The National Population Health Survey—its longitudinal nature." *Health Reports.* Statistics Canada Catalogue 82-003. Vol. 10, no. 4, p. 69-82. http://www.statcan.ca/bsolc/english/bsolc?catno=82-003-X&CHROPG=1&YR=1 (accessed November 16, 2007).

Tambay, Jean-Louis and Gary Catlin. 1995. "Sample design of the National Population Health Survey." *Health Reports.* Statistics Canada Catalogue no. 82-003. Vol. 7, no. 1, p. 29-42. http://www.statcan.ca/bsolc/english/bsolc?catno=82-003-X&CHROPG=1&YR=1 (accessed November 16, 2007).

Ustun, T.B., J - L Yuso-Mateos, S. Chatterji et al. 2004. "Global burden of depressive disorders in the year 2000." *British Journal of Psychiatry.* Vol. 184, p. 386-392.

Verhaak, Peter F., Monique J. Heijmans et al. 2005. "Chronic disease and mental disorder." *Social Science and Medicine.* Vol. 60, no. 4, p. 789-797.

Virtanen, Mariana, Mika Kivimaki, Marko Elovainio et al. 2005. "Mental health and hostility as predictors of temporary employment: Evidence from two prospective studies." *Social Science and Medicine.* Vol. 61, no. 10, p. 2084-2095.

Wang, Jianli. 2005. "Work stress as a risk factor for major depressive episode(s)." *Psychological Medicine.* Vol. 35, no. 6, p. 865-871.

Wang, Philip S., Arne Beck, Patricia Berglund et al. 2003. "Chronic medical conditions and work performance in the health and work performance questionnaire calibration surveys." *Journal of Occupational and Environmental Medicine.* Vol. 45, no. 12, p. 13031311.

Wilhelm, Kay, Vivianne Kovess, Carmen Rios-Seidel et al. 2004. "Work and mental health." *Social Psychiatry and Psychiatric Epidemiology.* Vol. 39, no. 11, p. 866-73.

Wilkins, Kathryn. 2004. "Bipolar 1 disorder, social support and work." *Health Reports.* Statistics Canada Catalogue no. 82-003, 15 (Suppl.), p. 21-30. http://www.statcan.ca/bsolc/english/bsolc?catno=82-003-S&CHROPG=1 (accessed November 16, 2007).

World Health Organization (WHO). *CIDI Online.* http://www.who.int/whosis/en/index.html (accessed November 16, 2007).

Yeo, Douglas, H. Mantel and T.P. Liu. 1999. "Bootstrap variance estimation for the National Population Health Survey." *Proceedings of the Annual Meeting of the American Statistical Association, Survey Research Methods Section.* Baltimore. American Statistical Association.